

WHAT IS CLAIMED IS:

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1. An information recording apparatus for recording information on a recording medium by irradiating a pulsed light onto the recording medium, comprising:

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a rotating mechanism that rotates the recording medium at one of predetermined recording speeds;

an optical head irradiating the pulsed light onto the recording medium; and

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a controller that controls the optical head so as to irradiate the pulsed light so that a length of a recording mark formed on the recording medium by irradiation of the pulsed light is an  $n$  times of a period  $T_w$  of a basic clock, where  $n$  is a natural number,

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the controller also controls the pulsed light in accordance with one of predetermined recording strategies which matches the one of the predetermined recording speeds so that the pulsed light contains a train of multi-pulses of a light having a recording power  $P_w$  and a light having a bias power  $P_b$  is

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irradiated during intervals between the adjacent multi-pulses and a light having an erasing power  $P_e$  is irradiated during intervals between adjacent trains of the multi-pulses, where a relationship  $P_w > P_e > P_b$  is  
5 satisfied,

wherein the controller adds an off-pulse to an end of a final pulse of the train of multi-pulses so that the light having the bias power  $P_b$  is irradiated during a period  $T_1$  of the off-pulse; and

10 the controller is capable of setting the period  $T_1$  of the off-pulse to a predetermined value so that a relationship  $0 \leq T_1 < 0.2T_w$  is satisfied.

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2. The information recording apparatus as claimed in claim 1, wherein the controller sets the predetermined value of the period  $T_1$  of the off-pulse  
20 when recording is performed in accordance with one of the predetermined recording strategies, which is used for the recording speed equal to or higher than 11 m/s.

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3. The information recording apparatus as  
claimed in claim 1, wherein the recording medium  
includes a recording layer formed of a material  
changeable into either an amorphous state and a crystal  
5 state, and the controller uses one of the predetermined  
recording strategies according to which the  
predetermined value of the period T1 of the off-pulse is  
set when a recrystallization upper limit linear velocity  
of the recording medium is 9 m/s to 13 m/s.

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4. The information recording apparatus as  
15 claimed in claim 1, wherein the controller uses one of  
the predetermined recording strategies according to  
which, when a rising of a head pulse of the train of the  
multi-pulses leads a time when one period Tw has passed  
after a rising of a logical data pulse by a time  
20 interval dTtop, a relationship  $-3T_w < dT_{top} < 0$  is satisfied.

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5. The information recording apparatus as claimed in claim 1, wherein the controller uses one of the predetermined recording strategies according to which the period T1 of the off-pulse is set as  $T1=0$ .

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6. The information recording apparatus as claimed in claim 1, wherein the recording medium is a DVD+RW, and the predetermined recording strategies includes a strategy for a recording speed of 3.5 m/s, a strategy for a recording speed of 8.4 m/s and a strategy for a recording speed of 14 m/s, and wherein the predetermined value of the period T1 is set when the strategy for the recording speed of 14 m/s is used to generate the pulsed light when recording.

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7. An information recording method for recording information on a recording medium by irradiating a pulsed light onto the recording medium so that a length of a recording mark formed on the

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recording medium by irradiation of the pulsed light is  
an  $n$  times of a period  $T_w$  of a basic clock, where  $n$  is a  
natural number, the recording medium including a  
recording layer formed of a material changeable into  
5 either an amorphous state and a crystal state, the  
recording medium having a recrystallization upper limit  
linear velocity of 9 m/s to 13 m/s, the method  
comprising the steps of:

irradiating the pulsed light containing a  
10 train of multi-pulses of a light having a recording  
power  $P_w$  and a light having a bias power  $P_b$  during  
intervals between the adjacent multi-pulses and a light  
having an erasing power  $P_e$  during intervals between  
adjacent trains of the multi-pulses, where a  
15 relationship  $P_w > P_e > P_b$  is satisfied; and

adding an off-pulse to an end of a final pulse  
of the train of the multi-pulses so that the light  
having the bias power  $P_b$  is irradiated during a period  
 $T_1$  of the off-pulse, the period  $T_1$  of the off-pulse  
20 being set to a predetermined value so that a  
relationship  $0 \leq T_1 < 0.2T_w$  is satisfied.

8. The information recording method as claimed in claim 7, wherein the predetermined value is set to the period T1 of the off-pulse when recording is performed at recording speed equal to or higher than 11  
5 m/s.

10 9. The information recording method as claimed in claim 7, wherein, when a rising of a head pulse of the train of the multi-pulses leads a time when one period Tw has passed after a rising of a logical data pulse by a time interval dTtop, a relationship -  
15  $3Tw < dT_{top} < 0$  is satisfied.

20 10. The information recording method as claimed in claim 7, wherein the period T1 of the off-pulse is set as  $T1=0$ .

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